

a fairly good market and better shipping facilities are assured, the breadfruit will be confined to strictly tropical markets.

COLLEGE OF HAWAII,  
HONOLULU.

## PINUS CARIBAEA: AN EXTENSION OF RANGE IN LOUISIANA

BY WILBUR R. MATTOON

Louisiana, west of the Pearl River watershed, has never been included within the range of *Pinus caribaea* Morelet, by any authority so far as has come to the attention of the writer. The western range of the species, as given by Sargent, is "along the Gulf coast to the valley of the Pear River, Louisiana."\*

During a southern trip in the spring of 1916, the writer had occasion to observe closely *Pinus caribaea* from its northeastern limit near Charleston, S. C., westward across the coastal plain into Mississippi and Louisiana. At Slidell, St. Tammany Parish, west of the Pearl River basin in Louisiana, reproduction from scattering seed trees left in logging occurs over the flatland and about vacant lots and yards in town. The resulting local landscape effect is most pleasing and leaves no doubt as to the opinion that slash pine is "by far the most handsome of all southern pines."† The numerous outlying ponds contain cull trees about their margins and heavy stands of young slash within and generally for some distance around the ponds. The soil here is the low flatland type consisting of sand overlying clay. A striking advance of slash pine over ponds and flat swamps, formerly occupied by cypress and some of the so-called hardwoods, has taken place extensively in the south due to the removal by logging of the former continuous and protective virgin forest cover. North of Slidell, pure stands of mature slash pine cover mile after mile along the New Orleans Great Northern Railroad

\* Sargent, Chas. S., Manual of the Trees of North America, page 18.

† Sargent, C. S., quoted by George Engelmann in the Revision of the Genus *Pinus* and Description of *Pinus Elliotii*, Transactions of the St. Louis Academy of Science, Vol. IV.

on lands within the Pearl River drainage basin. Logging and turpentine operations are being carried on by several large companies. Upon going in a northwesterly direction from Slidell to Covington on April 28, slash pine was observed in abundance over low ground. Particularly was this true of reproduction ranging in age from 3 to 20 years old and in height from about 4 to 50 feet. Older ages, however, were observed.

Slash pine in this region, as generally throughout its range, is



FIG. 1. Heavy stands of young *Pinus caribaea* on typical flat, sandy land near Slidell, La. The spread of slash is particularly rapid about towns where fire protection is afforded. (Tree marked x is a *Pinus taeda*.)

extensively replacing the original longleaf pine on the moister, flatland soils.\* The factors which account for this chiefly are the production of an abundance of seed, which is readily transported by wind and practically immune from destruction by hogs, a high degree of tolerance, and a very rapid and vigorous growth. While the young seedling is very susceptible to ground fires, the rapid upward growth in from 2 to 3 years carries the

\* This fact has been noted previously by various writers: Dr. Charles Mohr in Forest Service Bulletin 13, "The Timber Pines of the South," page 88; Dr. C. A. Sargent quoted by Dr. Engelmann in "Revision of the Genus *Pinus*," Transactions of the St. Louis Academy of Science, Vol. IV, 1880, and Manual of the Trees of North America, p. 19, by Sargent.

young tree beyond the real fire danger. These factors without question make *P. caribaea* better able than *Pinus palustris* to withstand the combined attack of hogs and fire.

In the close vicinity of Mandeville and Covington *Pinus Taeda* appeared. From the latter town westward as far as Hammond, Tangipahoa Parish, slash pine is confined rather to ponds and along stream borders than spread over large areas of flatland as happens farther east. About Hammond—half-way between the



FIG. 2. The drying of ponds, due to the cutting and burning of the surrounding forest, has permitted *Pinus caribaea* to invade new territory extensively throughout its range. St. Tammany Parish, west of the Pearl River watershed, Louisiana.

Pearl and the Mississippi rivers, and the most westerly point visited by the writer—slash was noted as quite common in young stands and scattered groups.

Its vigorous growth at Hammond, apparently as rapid as in any section previously visited, and its occurrence south of Hammond along the Illinois Central right-of-way, suggests the high probability that it occurs to the north and to the west doubtless as far as the natural barriers formed by the extensive outlying swamp and overflow lands of the Mississippi River. Locally the species was observed to maintain its long, clean

trunk, small crown of moderately small, curved, and forked branches, and relatively dense foliage as compared with that of both longleaf, and particularly, loblolly in its form of development over the southern coastal plain; the characteristic orange brown longitudinal bark plates are also well marked in the older trees. The region, it would seem, affords an excellent opportunity for someone to look for a farther extension of the western limit of this interesting and very valuable commercial yellow pine.

FOREST SERVICE, WASHINGTON, D.C.

## REVIEWS

### Gager's *Fundamentals of Botany and Laboratory Guide*\*

These two books represent an unusually comprehensive and serious attempt to present the study of plant life so that college students may secure a good perspective of botanical science as a whole. Furthermore both books show clearly that the author sees no place for college botany which is not founded upon extensive and intensive first-hand study of plants. The intent is not to have students merely read interesting text materials *about* plants, but text and manual are both so organized as to be useful only in connection with constant study of plants themselves.

In the organization of the text, presentation of functions of plants precede presentation of any large amount of structure, an order of presentation which has found place in the practices of the best teachers of college botany, and an order which is essential if the student is to know "what it is all about." The text's general consideration of plant functions (pages 21-143) gives significance to the life-history studies (pages 144-445). Classification of seed-bearing plants (pages 446-501) presents the modern conceptions of the relationships of the leading divisions of the angiosperms, and the rest of the text (pages 502-620) deals with such specially important topics as "Evolution," "Darwinism," "Experimental Evolution," "Heredity," "Paleobotany," etc.

\* Gager, C. Stuart, *Fundamentals of Botany*, 8 vo, pages xix+640; figures 434. *A Laboratory Guide for General Botany*, 8 vo, pages viii+191; both books published by P. Blakiston's Son and Company, Philadelphia, 1916.